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Prevalence of work-related Musculoskeletal Disorders and associated factors among faculty members of the College of Applied Medical Sciences, Taif University, Saudi Arabia: A cross-sectional study

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ABSTRACT

Objective: The aim of the study was to assess the prevalence and factors associated with work-related musculoskeletal disorders (WRMSDs) among faculty members of CAMS at Taif University, Saudi Arabia (SA). *Methods:* A cross-sectional study occurred from November 19 and December 1, 2024. Convenience sampling was used to recruit 43 faculty members in total. Upon obtaining the participants' informed consent, they completed the survey, which had three sections: The first section was about personal characteristics; the second section was about physical activity using the short form of the International Physical Activity Questionnaire; and the third section was about the prevalence of WRMSDs and workplace factors using a self-administrated questionnaire. *Results:* This study involved 43 participants (out of 79), with a slightly higher male (22; 51.2%) to female (21; 48.8%) ratio. The overall prevalence of WRMSDs among faculty members was 54.4%. The highest prevalence of WRMSDs among the participants was lower back (30.2%), followed by upper back (14%), neck and shoulder (5%), knee and ankle/foot (5%), and wrist/hand (4%). Shoulder WRMSD among faculty members was associated with the duration of keyboard, computer and laptop while wrist/hand complains were only associated with the duration of computer use. *Conclusion:* The study found that over half of the participants were affected by WRMSDs. This information can aid universities and decision-makers in creating specific interventions and support programs to improve the occupational health of faculty members, redesign the workplace, and modify the working conditions. As a result, this study could lead to considerable enhancement in the health and well-being of faculty members.

Keywords: Computer use, faculty members, prevalence, work-related musculoskeletal disorders

1. INTRODUCTION

The term musculoskeletal disorders (MSDs) encompasses a variety of inflammatory and degenerative diseases that affect muscles, tendons, ligaments, joints, peripheral nerves, and supporting blood arteries (Dewir, 2024). These include medical syndromes such as tendon inflammation (bursitis, epicondylitis, tenosynovitis), nerve compression disorders (carpal tunnel syndrome, sciatica), and osteoarthritis. MSDs can manifest as pain, numbness, tingling, stiffness, burning sensations, and more (Zakaria et al., 2002). A musculoskeletal disorder related to work events is called a work-related musculoskeletal disorder (WRMSD) (Sirajudeen et al., 2018). WRMSDs most commonly affect the neck, shoulder, forearm, hand, and lower back.

Multiple risk factors for the development and persistence of musculoskeletal symptoms in workers include strenuous exercise, repetitive motions, and uncomfortable, prolonged postures (Moom et al., 2014). WRMSDs are a considerable concern in public health issues, impacting both the health of workers and imposing costs on the healthcare system, as well as on the economy and society (Abledu and Abledu, 2012). MSDs are prevalent globally as the primary source of work-related illnesses, constituting over one-third of newly reported occupational illnesses (Bodhare et al., 2011). Within the United States alone, there were 522,528 cases of MSDs Waters, (2004), resulting in direct costs of $1.5 billion and indirect costs totaling $1.1 billion (Bhattacharya, 2014).

Early retirement and sick leave rates increased as a result of MSDs, which reduced worker productivity (Maguire and O'Connell, 2007, Erick and Smith, 2011). Over 40 million workers were affected by MSDs, which were the leading cause of work absenteeism in Europe. It is unthinkable for a modern individual to live without using electronic devices such as computers, laptops, smartphones, and tablets. The proportion of Saudi Arabians who own a computer for internet access has risen from 42.8% in 2021 to 59.2% in 2022 (2022). Inappropriate computer use increases the risk of health problems. Long periods spent working in a workspace that is not well-designed can result in MSDs.

University faculty members use computers for various tasks, including research, publication, e-learning, and creating presentations. University academic personnel also face high-stress levels, fast-paced workdays, minimal breaks, and excessive workloads. Continuing to work for prolonged periods without taking breaks heightens the likelihood of developing MSDs, which may lead to long-term disability (Kuorinka et al., 1987). According to Punnet and Bergqvist's analysis of epidemiologic data, the risk of MSD symptoms increases progressively with each hour of daily computer use (Punnett and Bergqvist, 1997). A study conducted by Lima-Junior and Silva, (2014) to explore the MSDs among professors at Brazilian universities found a high prevalence rate of 85.7%.

A study conducted by Sirajudeen et al., (2018), to determine the occurrence and influencing factors of WRMSDs among the College of Applied Medical Sciences (CAMS) faculty members of Majmaah University, Saudi Arabia found over half of the participants were affected with WRMSDs. This issue highlights the need for studies to focus on this population to understand patterns, causes, and prevention of WRMSDs. Consequently, the aim of the study is to assess the prevalence and factors associated with WRMSDs among faculty members of CAMS at Taif University.

2. METHODS

This cross-sectional study involved faculty members of applied medical sciences college at Taif University in SA, conducted between November 19 and December 1 of 2024. Participants were asked to fill out an online questionnaire in English using a Google form. All participants received the link to the survey via email and also via social media Apps (WhatsApp).

Inclusion and Exclusion Criteria

Inclusion criteria: Faculty members were accepted into the study if they are from various departments (e.g., Physical therapy, Radiology, and medical laboratory) at CAMS, Taif University, who worked for at least 6 months in the study setting before data collection.

Exclusion criteria: Faculty members were not allowed to participate if they had a history of accidents affecting the musculoskeletal system (fracture to limbs or spine due to road traffic accident or fall), major surgery in any part of the body, chronic illness, and pregnancy.

The study was approved by the ethics committee of Taif University, SA, with reference number HAPO-02-T-105 on 18-11-2024.

A self-administered online questionnaire was adopted from the standardized Nordic questionnaire (Crawford, 2007). The questionnaire was mainly intended to collect data about self-reported musculoskeletal pain and work-related issues among faculty members. The survey consisted of 3 sections; the first section covered the personal characteristics (nationally, gender, department, age, body mass index (BMI), level of education, and work position); the second section covered the physical activity levels among participants using the short form of the International Physical Activity Questionnaire (IPAQ) Lima-Júnior and Silva, (2014) and the third section was about the prevalence of WRMSDs and workplace. The current study included 79 faculty members who met the inclusion criteria. The same researcher collected data from 43 participants within 2 weeks (43/79).

Statistical Analysis

A statistical analysis performed using the Statistical Package for the Social Sciences (SPSS) version 25.0 (SPSS Inc., Chicago, IL, USA). A descriptive analysis of demographic characteristics and work history was conducted. To determine the prevalence of WRMSDs (for each body region), the number of subjects affected in that body region was divided by the total number of subjects studied and then multiplied by 100. The association between demographic characteristics, work history, physical activity, and prevalence of WRMSDs was analyzed using the Chi-square and Fisher's Exact tests of association. The level of statistical significance was set at 5%.

3. RESULTS

This study involved 43 participants, with a slightly higher male (51.2%) to female (48.8%) ratio. Almost half of the participants were between 36 and 40 years of age. Most of the respondents were physical therapists (19; 44.2%). Of the study participants, 39 (90.7%) were Ph.D. holders. Regarding body mass index, out of the participants, 20 (46.5%) faculty members were overweight (25 - 29.99 kg/m2). Furthermore, 32.6% of the responders had 11-15 years of current experience in academia, and 33 (76.7%) worked between 6- 10 hours daily presented in (Table 1). In this study, the overall prevalence of WRMSDs among faculty members at CAMS was 54.4% (43 out of 79 faculty members). The highest prevalence of WRMSDs among the participants was the lower back (13; 30.22%), followed by upper back (6; 13.94%), neck (5; 11.62%), shoulders (5; 11.62%), knees (5; 11.6%), and ankles/feet (5; 11.62%).

Table 1 Socio-demographic characteristics of the faculty members in CAMS, Taif University, SA 2024

Category of variables (N=43)	**Number (%)**
Gender	
Male	22 (51.2)
Female	21 (48.8)
Department	
Physical Therapy	19 (44.2)
Radiology	8 (18.6)
Medical Laboratory	16 (37.2)
Age	
25-30	1 (2.3)
31-35	2 (4.7)
36-40	19 (44.2)
41-45	5 (11.6)
46-50	8 (18.6)
51-55	8 (18.6)
Body mass index (BMI)	
Normal weight (18.5 - 24.99)	10 (23.3)

Overweight (25 - 29.99)	20 (46.5)
Obese (30 - 34.99)	12 (27.9)
Extremely obese (> 35)	1 (2.3)
Education level	
MSC	4 (9.3)
Ph.D.	39 (90.7)
Current experience (years)	
< 1 year	2 (4.7)
1-5 years	10 (23.3)
6-10 years	17 (39.5)
11-15 years	14 (32.6)
Daily working (hours)	
6-10 hours	33 (76.7)
11-14 hours	9 (20.9)
15-18 hours	1 (2.3)

The least common disorder reported was wrists/hands (4; 9.29%) presented in (Table 2 and Figure 1). The most common disorder among males was the lower back (6; 13.95%), while the least common disorder was both shoulders and knees (2; 4.65%, 2; 4.65%), respectively. The most common disorder among females was the lower back (7; 16.27%), while the least common disorder was wrists/hands (1; 2.32%) as presented in (Table 2 and Figure 1). The information about the workplace presented in (Table 3). More than half of the faculty members involved in the study were assistant professors (24; 55.8%), and about 23 of them (53.3%) reported daily computer use (less than 5 hours). Most of the participants (30; 69.8%) also reported insufficient break time during the workday.

Table 2 Prevalence of the WRMSDs by specific body parts among faculty members with gender in CAMS at Taif University, Saudi Arabia, 2024

Affected body parts	Sub-Division	Number (%)	Total Number (%)
Neck	Male	3 (6.97%)	5 (11.62%)
	Female	2 (4.65%)	
Shoulders	Male	2 (4.65%)	5 (11.62%)
	Female	3 (6.97%)	
Wrists/Hands	Male	3 (6.97%)	4 (9.29%)
	Female	1 (2.32%)	
Upper back	Male	3 (6.97%)	6 (13.94%)
	Female	3 (6.97%)	
Lower back	Male	6 (13.95%)	13 (30.22)
	Female	7 (16.27%)	
Knees	Male	2 (4.65%)	5 (11.62%)
	Female	3 (6.97%)	
Ankles/Feet	Male	3 (6.97%)	5 (11.62%)
	Female	2 (4.65%)	

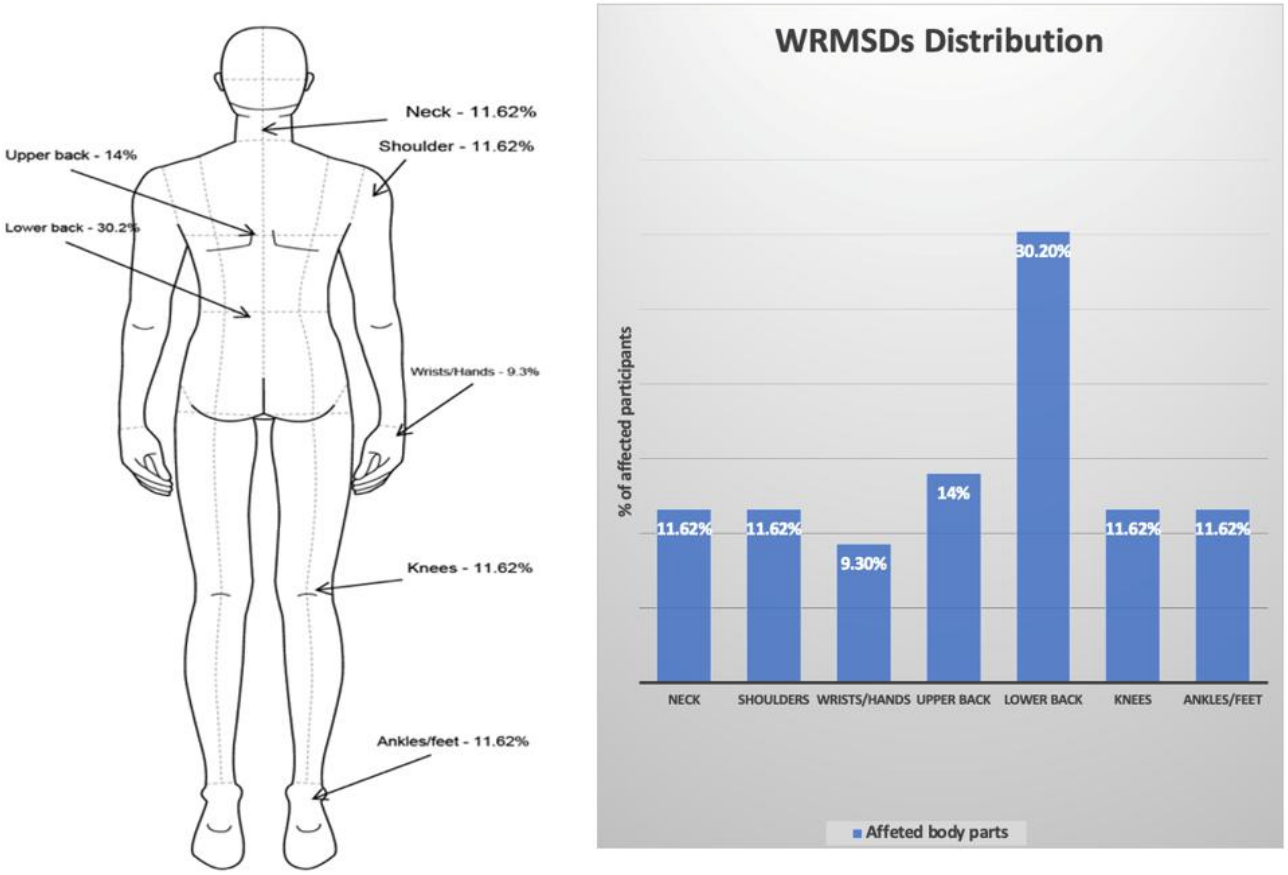

Figure 1 Distribution of work-related musculoskeletal disorders among faculty members in CAMS.

Table 3 Characteristics of the workplace of the participants in CAMS, Taif University, SA 2024

Characteristics	Number (%)
Work position	
Lecturer	4 (9.3)
Assistant professor	24 (55.8)
Associate professor	10 (23.3)
Professor	5 (11.6)
Daily use of computer (hours)	
<5 hours	23 (53.5)
5-10 hours	17 (39.5)
11-15 hours	3 (7)
Daily use of the keyboard (hours)	
1-5 hour(s)	27 (62.8)
6-10 hours	14 (32.6)
11-15 hours	2 (4.7)
Daily use of the laptop (hours)	
<5 hour(s)	20 (46.5)
5-10 hours	21 (48.8)
11-15 hours	2 (4.7)
Using the external mouse	

Yes	21 (48.7)
No	22 (51.2)
Break sufficient	
Yes	12 (27.9)
Somewhat	30 (69.8)
No	1 (2.3)
Vigorous physical activity (days/week)	
None	17 (39.5)
1-2 day(s)/week	14 (32.6)
3-4 days/week	8 (18.6)
> 4 days/week	4 (9.3)
Moderate physical activity (days/week)	
None	15 (34.9)
1-2 day(s)/week	16 (37.2)
3-4 days/week	7 (16.3)
4 days/week	5 (11.6)
Walking (days/week)	
None	5 (11.6)
1-2 day(s)/week	13 (30.2)
3-4 days/week	11 (25.6)
4 days/week	14 (32.6)

Table 4 provides an overview of the association between WRMSDs and socio-demographic characteristics and workplace characteristics of the participants. Even though the upper and lower backs were the most prevalent of WRMSDs in this study, both disorders were not significantly associated with other attributes except that the upper back was significantly associated only with Saudi faculty members (P=.03). The neck WRMSD was significantly associated with several factors: Age (P=.04) for those ranging between 46-50 years, education level (P=.01) with PhD holders, work position (P=.03) with lecturers and associate professors, and insufficient breaks (P=.01). Daily use of computers was significantly associated with shoulder WRMSD (P=.003) among participants who spent 5-10 hours daily.

Table 4 Association between WRMSDs, socio-demographic characteristics, and workplace characteristics

Characteristics	**Neck**		**Shoulders**		**Wrists/Hands**		**Upper back**		**Lower back**		**Knees**		**Ankles/Feet**	
	Yes N (%)	*No*	*Yes N (%)*	*No*	*Yes N (%)*	*No*	*Yes N (%)*	*No*	*Yes N (%)*	*No*	*Yes N (%)*	*No*	*Yes N (%)*	*No*
Nationality														
Saudi	3 (7)	23 (53.5)	2 (5)	24 (55.8)	3 (7)	23 (53.5)	6 (14)	20 (46.5)	6 (14)	20 (46.5)	2 (5)	24 (55.8)	4 (9)	22 (51.2)
Non-Saudi	2 (5)	15 (34.9)	3 (7)	14 (32.6)	1 (2)	16 (37.2)	0 (0)	17 (39.5)	7 (16)	10 (23.3)	3 (7)	14 (32.6)	1 (2)	16 (37.2)
P value	1.00		0.37		1.00		0.03*		0.21		0.37		0.63	
Gender														
Male	3 (7)	19 (44.2)	2 (5)	20 (46.5)	3 (7)	19 (44.2)	3 (7)	19 (44.2)	6 (14)	16 (37.2)	2 (5)	20 (46.5)	3 (7)	19 (44.2)
Female	2 (5)	19 (44.2)	3 (7)	18 (41.9)	1 (2)	20 (46.5)	3 (7)	18 (41.9)	7 (16)	14 (32.6)	3 (7)	18(41.9)	2 (5)	19 (44.2)
P value	1.00		0.66		0.61		1.00		0.66		0.66		1.00	

Department														
Physical Therapy	4 (9)	15 (34.9)	2 (5)	17 (39.5)	0 (0)	19 (44.2)	4 (9)	15 (34.9)	4 (9)	15 (34.9)	4 (9)	15 (34.9)	1 (2)	18 (41.9)
Radiology	1 (2)	7 (16.3)	1 (2)	7 (16.3)	2 (5)	6 (14.0)	0 (0)	8 (18.6)	3 (7)	5 (11.6)	0 (0)	8 (18.6)	1 (2)	7 (16.3)
Medical Laboratory	0 (0)	16 (37.2)	2 (5)	14 (32.6)	2 (5)	14 (32.6)	2 (5)	14 (32.6)	6 (14)	10 (23.3)	1 (2)	15 (34.9)	3 (7)	13 (30.2)
P value	0.15		1.00		.05*		0.46		0.57		0.25		0.48	
Age														
25-30	1 (2)	0 (0.0)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)
31-35	0 (0)	2 (4.7)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	1 (2)	1 (2.3)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	1 (2)	1 (2.3)
36-40	1 (2)	18 (41.9)	2 (5)	17 (39.5)	2 (5)	17 (39.5)	5 (12)	14 (32.6)	6 (14)	13 (30.2)	2 (5)	17 (39.5)	1 (2)	18 (41.9)
41-45	1 (2)	4 (9.3)	1 (2)	4 (9.3)	0 (0)	5 (11.6)	0 (0)	5 (11.6)	1 (2)	4 (9.3)	1 (2)	4 (9.3)	1 (2)	4 (9.3)
46-50	2 (5)	6 (14.0)	0 (0)	8 (18.6)	2 (5)	6 (14.0)	0 (0)	8 (18.6)	3 (7)	5 (11.6)	1 (2)	7 (16.3)	0 (0)	8 (18.6)
51-55	0 (0)	8 (18.6)	2 (5)	6 (14.0)	0 (0)	8 (18.6)	0 (0)	8 (18.6)	3 (7)	5 (11.6)	1 (2)	7 (16.3)	2 (5)	6 (14.0)
P value	.04*		0.60		0.59		0.15		1.00		0.94		0.17	
Body mass index (BMI)														
Normal weight (18.5 - 24.99)	2 (5)	8 (18.6)	2 (5)	8 (18.6)	0 (0)	10 (23.3)	1 (2)	9 (20.9)	2 (5)	8 (18.6)	1 (2)	9 (20.9)	2 (5)	8 (18.6)
Overweight (25 - 29.99)	1 (2)	19 (44.2)	1 (2)	19 (44.2)	3 (7)	17 (39.5)	4 (9)	16 (37.2)	7 (16)	13 (30.2)	2 (5)	18 (41.9)	2 (5)	18 (41.9)
Obese (30 - 34.99)	2 (5)	10 (23.3)	2 (5)	10 (23.3)	1 (2)	11 (25.6)	1 (2)	11 (25.6)	4 (9)	8 (18.6)	1 (2)	11 (25.6)	1 (2)	11 (25. 6)
Extremely obese (> 35)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	1 (2)	0 (0.0)	0 (0)	1 (2.3)
P value	0.54		0.54		0.81		0.78		0.83		.05*		0.73	
Education level														
MSC	2 (5)	2 (4.7)	0 (0)	4 (9.3)	0 (0)	4 (9.3)	1 (2)	3 (7.0)	1 (2)	3 (7.0)	0 (0)	4 (9.3)	0 (0)	4 (9.3)
Ph.D.	3 (7)	36 (83.7)	5 (12)	34 (79.1)	4 (9)	35 (81.4)	5 (12)	34 (79.1)	12 (28)	27 (62.8)	5 (12)	34 (79.1)	5 (12)	34 (79.1)
P value	.01*		1.00		1.00		0.46		1.00		1.00		1.00	
Work position														
Lecturer	2 (5)	2 (4.7)	0 (0)	4 (9.3)	0 (0)	4 (9.3)	1 (2)	3 (7.0)	1 (2)	3 (7.0)	0 (0)	4 (9.3)	0 (0)	4 (9.3)
Assistant Professor	1 (2)	23 (53.5)	3 (7)	21 (48.8)	1 (2)	23 (53.5)	3 (7)	21 (48.8)	7 (16)	17 (39.5)	4 (9)	20 (46.5)	5 (12)	19 (44.2)
Associate professor	2 (5)	8 (18.6)	0 (0)	10 (23.3)	2 (5)	8 (18.6)	2 (5)	8 (18.6)	4 (9)	6 (14.0)	0 (0)	10 (23.3)	0 (0)	10 (23.3)
Professor	0 (0)	5 (11.6)	2 (5)	3 (7.0)	1 (2)	4(9.3)	0 (0)	5 (11.6)	1 (2)	4 (9.3)	1 (2)	4 (9.3)	0 (0)	5 (11.6)
P value	0.03*		0.16		0.26		0.55		0.91		0.48		0.37	
Vigorous physical activity (days/week)														
None	3 (7)	14 (32.6)	0 (0)	17 (39.5)	1 (2)	16 (37.2)	2 (5)	15 (34.9)	8 (19)	9 (20.9)	3 (7)	14 (32.6)	0 (0)	17 (39.5)
1-2 day(s)/week	1 (2)	14 (32.6)	3 (7)	12 (27.9)	1 (2)	14 (32.6)	4 (9)	11 (25.6)	3 (7)	12 (27.9)	2 (5)	13 (30.2)	1 (2)	14 (32.6)

3-4 days/week	1 (2)	7 (16.3)	1 (2)	7 (16.3)	1 (2)	7 (16.3)	0 (0)	8 (18.6)	2 (5)	6 (14.0	0 (0)	8 (18.6)	3 (7)	5 (11.6)
- > 4 days/week	0 (0)	3 (7.0)	1 (2)	2 (4.7)	1 (2)	2 (4.7)	0 (0)	3 (7.0)	0 (0)	3 (7.0)	0 (0)	3 (7.0)	1 (2)	2 (4.7)
P value	0.88		0.10		0.43		0.41		0.27		0.80		.01*	
Moderate physical activity (days/week)														
None	3 (7)	12 (27.9)	1 (2)	14 (32.6)	1 (2)	14 (32.6)	1 (2)	14 (32.6)	8 (19)	7 (16.3)	0 (0)	15 (34.9)	1 (2)	14 (32.6)
1-2 day(s)/week	2 (5)	14 (32.6)	3 (7)	13 (30.2)	2 (5)	14 (32.6)	3 (7)	13 (30.2)	3 (7)	13 (30.2)	2 (5)	14 (32.6)	1 (2)	15 (34.9)
3-4 days/week	0 (0)	7 (16.3)	1 (2)	6 (14.0)	1 (2)	6 (14.0)	1 (2)	6 (14.0)	1 (2)	6 (14.0)	2 (5)	5 (11.6)	1 (2)	6 (4.0)
> 4 days/week	0 (0)	5 (11.6)	0 (0)	5 (11.6)	0 (0)	5 (11.6)	1 (2)	4 (9.3)	1 (2)	4 (9.3)	1 (2)	4 (9.3)	2 (5)	3 (7.0)
P value	0.59		0.78		1.00		0.80		0.14		0.15		0.21	
Walking (days/week)														
None	1 (2)	4 (9.3)	0 (0)	5 (11.6)	1 (2)	4 (9.3)	2 (5)	3 (7.0)	1 (2)	4 (9.3)	0 (0)	5 (11.6)	0 (0)	5 (11.6)
1-2 day(s)/week	1 (2)	12 (27.9)	0 (0)	13 (30.2)	1 (2)	12 (27.9)	1 (2)	12 (27.9)	7 (16)	6 (14.0)	2 (5)	11 (25.6)	1 (2)	12 (27.9)
3-4 days/week	1 (2)	10 (23.3)	2 (5)	9 (20.9)	0 (0)	11 (25.6)	1 (2)	10 (23.3)	2 (5)	9 (20.9)	3 (7)	8 (18.6)	2 (5)	9 (20.9)
> 4 days/week	2 (5)	12 (27.9)	3 (7)	11 (25.6)	2 (5)	12 (27.9)	2 (5)	12 (27.9)	3 (7)	11 (25.6)	0 (0)	14 (32.6)	2 (5)	12 (27.9)
P value	0.92		0.31		0.58		0.38		0.20		0.16		0.92	
Current experience (years)														
< 1 year	0 (0)	2 (4.7)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	1 (2)	1 (2.3)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	1 (2)	1 (2.3)
1-5 years (s)	0 (0)	10 (23.3)	1 (2)	9 (20.9)	1 (2)	9 (20.9)	1 (2)	9 (20.9)	5 (12)	5 (11.6)	0 (0)	10 (23.3)	2 (5)	8 (18.6)
6-10 years	1 (2)	16 (37.2)	3 (7)	14 (32.6)	2 (5)	15 (34.9)	2 (5)	15 (34.9)	4 (9)	13 (30.2)	4 (9)	13 (30.2)	1 (2)	16 (37.2)
11-15 years	4 (9)	10 (23.3)	1 (2)	13 (30.2)	1 (2)	13 (30.2)	2 (5)	12 (27.9)	4 (9)	10 (23.3)	1 (2)	13 (30.2)	1 (2)	13 (30.2)
P value	0.17		0.87		1.00		0.55		0.45		0.39		0.21	
Daily working (hours)														
6-10 hours	5 (12)	28 (65.1)	4 (9)	29 (67.4)	2 (5)	31 (72.1)	4 (9)	29 (67.4)	10 (23)	23 (53.5)	3 (7)	30 (69.8)	5 (12)	28 (65.1)
11-14 hours	0 (0)	9 (20.9)	1 (2)	8 (18.6)	2 (5)	7 (16.3)	2 (5)	7 (16.3)	2 (5)	7 (16.3)	2 (5)	7 (16.3)	0 (0)	9 (20.9)
15-18 hours	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	1 (2)	0 (0.0)	0 (0)	1 (2.3)	0 (0)	1 (2.3)
P value	0.617		1.00		0.27		0.65		0.46		0.37		0.62	
Daily use of computer (hours)														
<5 hours	3 (7)	20 (46.5)	0 (0)	23 (53.5)	0 (0)	23 (53.5)	5 (12)	18 (41.9)	8 (19)	15 (34.9)	3 (7)	20 (46.5)	4 (9)	19 (44.2)
5-10 hours	2 (5)	15 (34.9)	3 (7)	14 (32.6)	4 (9)	13 (30.2)	0 (0)	17 (39.5)	5 (12)	12 (27.9)	2 (5)	15 (34.9)	1 (2)	16 (37.2)
11-15 hours	0 (0)	3 (7.0)	2 (5)	1 (2.3)	0 (0)	3 (7.0)	1 (2)	2 (4.7)	0 (0)	3 (7.0)	0 (0)	3 (7.0)	0 (0)	3 (7.0)
P value	1.00		.003*		.03*		0.06		0.67		1.00		0.57	

Daily use of the keyboard (hours)														
1-5 hour(s)	4 (9)	23 (53.5)	1 (2)	26 (60.5)	2 (5)	25 (58.1)	5 (12)	22 (51.2)	8 (19)	19 (44.2)	4 (9)	23 (53.5)	3 (7)	24 (55.8)
6-10 hours	1 (2)	13 (30.2)	3 (7)	11 (25.6)	2 (5)	12 (27.9)	0 (0)	14 (32.6)	5 (12)	9 (20.9)	1 (2)	13 (30.2)	2 (5)	12 (27.9)
11-15 hours	0 (0)	2 (4.7)	1 (2)	1 (2.3)	0 (0)	2 (4.7)	1 (2)	1 (2.3)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	0 (0)	2 (4.7)
P value	0.72		.04*		0.67		0.06		0.87		0.72		1.00	
Daily use of the laptop (hours)														
<5 hour(s)	2 (5)	18 (41.9)	0 (0)	20 (46.5)	0 (0)	20 (46.5)	3 (7)	17 (39.5)	8 (19)	12 (27.9)	3 (7)	17 (39.5)	4 (9)	16 (37.2)
5-10 hours	2 (5)	19 (44.2)	4 (9)	17 (39.5)	4 (9)	17 (39.5)	3 (7)	18 (41.9)	5 (12)	16 (37.2)	2 (5)	19 (44.2)	1 (2)	20 (46.5)
11-15 hours	1 (2)	1 (2.3)	1 (2)	1 (2.3)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	0 (0)	2 (4.7)	0 (0)	2 (4.7)
P value	0.26		.03*		0.13		1.00		0.38		0.74		0.36	
Using the external mouse														
Yes	3 (7)	18 (41.9)	4 (9)	17 (39.5)	1 (2)	20 (46.5)	3 (7)	18 (41.9)	6 (14)	15 (34.9)	3 (7)	18 (41.9)	1 (2)	20 (46.5)
No	2 (5)	20 (46.5)	1 (2)	21 (48.8)	3 (7)	19 (44.2)	3 (7)	19 (44.2)	7 (16)	15 (34.9)	2 (5)	20 (46.5)	4 (9)	18 (41.9)
P value	0.66		0.19		0.61		1.00		0.82		0.66		0.34	
Break sufficient														
Yes	2 (5)	10 (23.3)	1 (2)	11 (25.6)	1 (2)	11 (25.6)	2 (5)	10 (23.3)	5 (12)	7 (16.3)	1 (2)	11 (25.6)	0 (0)	12 (27.9)
Somewhat	2 (5)	28 (65.1)	4 (9)	26 (60.5)	3 (7)	27 (62.8)	4 (9)	26 (60.5)	8 (19)	22 (51.2)	4 (9)	26 (60.5)	5 (12)	25 (58.1)
No	1 (2)	0 (0.0)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)	0 (0)	1 (2.3)
P value	.01*		1.00		1.00		1.00		0.63		1.000		0.38	

N: Number of participants, %: Percentage of participants, P: Chi-square/ Fisher's Exact test, *P≤05, WRMSDs: Work-related musculoskeletal disorders

Also, shoulder complaints were significantly associated with the keyboard use (P=.04) among participants who spent 6-10 hours daily. Furthermore, the daily laptops use by those participants who spent 5-10 hours was significantly associated with shoulder WRMSD (P=.03). The wrist/hand WRMSD was significantly associated with participants working in radiology and medical laboratory departments (P=.04), and daily use of computers (P=.03), for those who spent 5-10 hours. Knee WRMSD was significantly associated only with BMI (P=.05) with those overweight faculty members, and finally, ankles/feet WRMSDs were significantly associated with those participants doing vigorous physical activity 3-4 days/week (P=.01).

4. DISCUSSION

The aim of the study was to assess the prevalence and factors associated with WRMSDs among faculty members of CAMS at Taif University, Saudi Arabia (SA). The overall prevalence of WRMSDs among members was 54.4%. In the current study, the prevalence rate was lower than the prevalence reported by both university members at Majmaah University, SA, and university professors in Brazil in 55% and 85.7%, respectively (Lima-Júnior and Silva, 2014; Sirajudeen et al., 2018). In the current study, lower-back WRMSD was the most prevalent reported by the participants (30.2%). This is consistent with other studies: the study conducted among university professors in Brazil (54.8%), another study about secondary schoolteachers in Hail city in SA (62.55%) and from other regions in SA (Alsiddiky et al., 2014; Sirajudeen et al., 2018; Althomali et al., 2021).

Teachers were generally prone to activities that lead to back pain such as standing for long hours while giving lectures, and twisting of the back while reading and grading assignments. Neck and shoulder WRMSDs were reported as the third most prevalent among the participants at 5% each. The neck and shoulder complaints were consistent with the study about physical therapists in SA at 59.2% and 40.7%, respectively. Faculty members who did not take sufficient breaks were linked to neck issues in the present study. The use of a computer, laptop, or keyboard for extended periods of time daily was associated with shoulder WRMSD. The author noticed a higher frequency (14%) of upper back complaints among faculty members. This result may be related to working for a long period in an unchanged position and faulty posture.

The finding aligns with the study in other professionals including nurses working in SA (48.9%) who spent time in awkward postures, stooping, and repetitive actions (Tariah et al., 2020). The prevalence of both knees and ankles/feet disorders was about 11.6% each. The association between knee pain disorder and overweight faculty members was found to be significant. This finding aligns with a similar study conducted among school teachers in Selangor, Malaysia (Zamri and Mahiyuddin, 2024). The current study shows that ankles/feet disorder was significantly associated with vigorous physical activity, contrary to another study which found that physical activity was associated with less musculoskeletal pain, including ankles/feet disorder (Rhim et al., 2022). The author found lower frequency (4%) of wrist/hand complaints among faculty members.

The association between wrists/hands pain and faculty members in the medical laboratory and radiology departments who spend 5-10 hours daily using computer was found to be significant. This finding aligns with a similar study conducted among office workers in China which found that prolonged use of computers is associated with the carpal tunnel syndrome which affects wrists/hands (Feng et al., 2021). This research provides valuable insights into WRMSDs in faculty members of CAMS at Taif University, despite some limitations. This research employed a cross-sectional design which restricts the ability to establish a causal relationship and consider reverse causation. Additionally, the research offers limited proof connecting exposure and outcomes due to challenges in distinguishing between cause and effect. A self-reported survey may also be influenced by reporting bias.

5. CONCLUSION

This research focused on exploring the frequency of WRMSDs and related factors among faculty members in CAMS at Taif University in SA. 54.4% of the participants were affected by WRMSDs. This information can aid universities and decision-makers in creating specific interventions and support programs to improve the occupational health of faculty members, redesign the workplace, and modify the working conditions. As a result, this study could lead to considerable enhancement in the health and well-being of faculty members.

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Authors's contributions

Ibrahim Saeed Aljulaymi contributed to conception, design, and statistical analysis, manuscript preparation, manuscript editing, and review. Ms. Alanoud Almalki, Ms. Rania Turkestani, Ms. Thekra Alosaimi, Ms. Rawan Alghamdi, Ms. Asayeel Alzhrani, and Ms. Abeer Althobiti contributed to data collection. Ibrahim Saeed Aljulaymi, the author, has critically reviewed and approved the final draft and is responsible for the manuscript's content.

Ethical approval

The study was approved by the ethics committee of Taif University, SA, with reference number HAPO-02-T-105 on 18-11-2024.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

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Conflict of interest
The authors declare that there is no conflict of interests.

Data and materials availability
All data sets collected during this study are available upon reasonable request from the corresponding author.

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